Tempe Aviation Commission

IGA Monitoring Report

Month:

September 2004

Prepared by:

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City of Tempe, 31 East 5th Street, Tempe AZ 85280

12/14/04

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1. Introduction

This report is prepared by TAVCO to monitor the compliance of operations at Phoenix Sky Harbor International Airport with certain noise mitigation flight procedures over the City of Tempe. The Tempe Aviation Commission (TAVCO) consists of Tempe residents selected by the Tempe Mayor and City Council to assist and advice on aviation issues. The City of Tempe is located directly east of the Phoenix Sky Harbor International Airport in Phoenix, which has 3 parallel runways, Runway 8/26, Runway 7L/25R and Runway 7R/25L.

In 1994 the City of Phoenix and the City of Tempe agreed to continue noise mitigation flight procedures already in use over Tempe and to introduce a new procedure for aircraft arriving over Tempe to the new third runway (7R/25L) at Phoenix Sky Harbor International Airport from the east. Tempe had prior to the agreement challenged the plans for the construction of a third runway because of inadequate assessment of the environmental impacts.

a) The 4-DME procedure

The 1993 Environmental Impact Statement (EIS)

According to the EIS, which among other planned improvements included the construction of a third runway, departures to the east from the new runway would follow the so-called "One-DME" Standard Instrument Departure procedure (SID) similar to the SID already in use by aircraft departing to the east from the airport[1].

The 1994 Record of Decision

The continued use of the "One-DME procedure was also stated in the Record of Decision (ROD) where the FAA approved the plans for a third runway. When Phoenix and Tempe signed the Intergovernmental Agreement (IGA) on noise mitigation flight procedures over Tempe, the FAA reaffirmed its commitment to uphold these procedures. The "One-DME procedure" became the "4-DME procedure" when a navigational aid (VORTAC) was moved.

Standard Instrument Departure Procedure (SID)

North Runway 8L (Now 8): "Fly heading 085º to intercept PHX-075, across PXR R-350 at or below 3,000'. At 4 DME east of PHX VORTAC, turn right/left"
Center Runway 8R (Now 7L): "Fly direct PHX VORTAC, cross PHR at or below 3,000'. Proceed via PHX R-075 to 4 DME east, turn right/left" (FAA SW-1 of August 10, 2000)

Measure for Departure Procedure Compliance

Based on the 4-DME Standard Instrument Departure procedure (SID) TAVCO proposed a corridor along the Salt River to measure how commercial jet aircraft and large turboprop aircraft[2] complied with the "4-DME procedure" using the Noise and Flight Track Monitoring System that the airport had agreed to install. This proposal was adopted by the Tempe City Council, but was rejected by the City of Phoenix. The airport use a vertical line to measure compliance of jet departures called the"4-DME Gate" or the "Exit Window Only Gate", which is a 5,500 feet long imaginary line running

[1] Source: Final Environmental Impact Statement Phoenix sky Harbor International Airport Master Plan Update Improvements, November 1993, Section 5.
[2] Aircraft certified and operated according to Title 14 FAR Part 121 or 135 with gross weight exceeding 12,500 pounds.

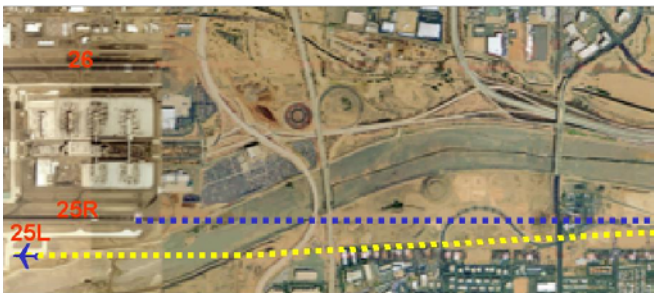
north south at 4-DME or approximately at Price Road. Turns by carrier jets north or south away from the Salt riverbed before reaching this line, or failures to stay inside the north or south end of this line are registered and in a compiled format submitted to the airlines in a "Notice of Deviation" letter by the airport. Deviations influenced by local weather conditions are excluded from the notification procedure.

This report compares departure compliance using the Tempe Corridor and the Phoenix "4-DME Gate" or "Exit Window Only Gate", and includes large turboprop aircraft because they are part of the 1994 agreement. Since the implementation of the "4-DME Gate" deviation standard for large carriers in 1997, the main issue of concern has been how well these aircraft on departure from Phoenix Sky Harbor International Airport to the east keep to the Salt riverbed and avoid flying over populated areas in Tempe.

b) The "Side Step" procedure

This is a noise mitigating procedure for jets and large turboprop aircraft that approach Phoenix Sky Harbor International Airport from the east to land on the new south runway, Runway 25L. Aircraft are directed to approach the center runway, Runway 25R, until they are 3 NM from the runway end or abeam Sun Devil Stadium at Mill Avenue in Tempe. At this point the pilot can be requested by the Phoenix Air Traffic Control to change the approach course to land on Runway 25L. When the pilot directs the aircraft from a stabilized approach to the Runway 25R towards the left and line up for landing on Runway 25L, the pilot performs a "side step procedure". This procedure is designed to keep large aircraft approaches over the river bed as long as possible before they close in towards neighborhoods in downtown Tempe south of the riverbed.

Side-step Procedure



No measure has been set up in the airport Noise and Flight Track Monitoring System to monitor the use of this procedure, and in its present format this report does not include any data on the utilization of the "side step" procedure.

On March 27, 2002 the FAA suspended implementation of a charted "side step" procedure because of flight safety concerns. Presently the FAA is clearing jets and large turboprop aircraft for straight-in approaches to Runway 25L from the east.

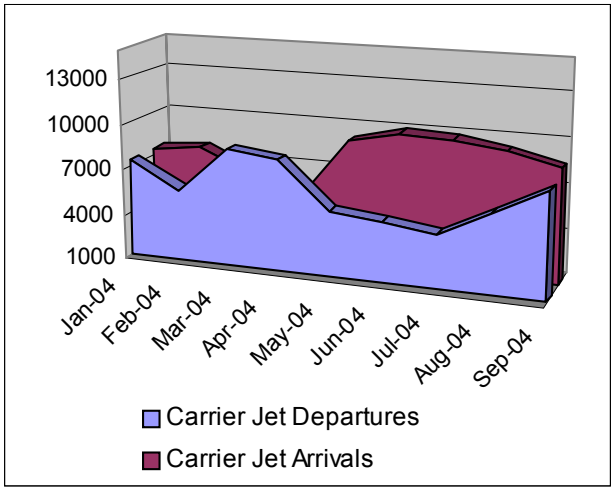
c) Departure Split (Equalization)

This procedure attempts to disperse evenly on an annual basis the noise impact of departing eastbound and westbound aircraft between Tempe and Phoenix during day and nighttime hours.

2. Aircraft Operations

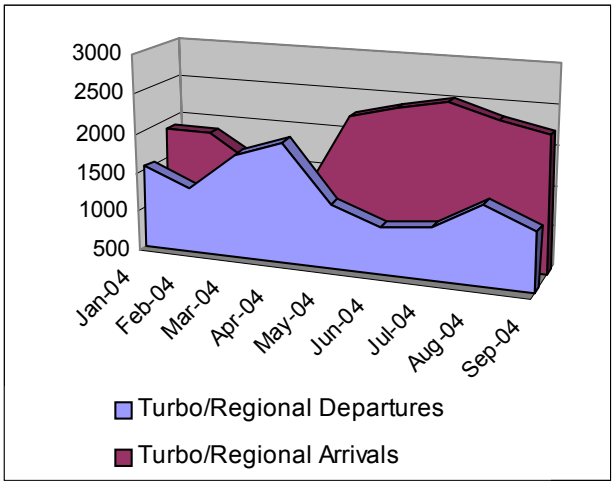
Carrier Aircraft

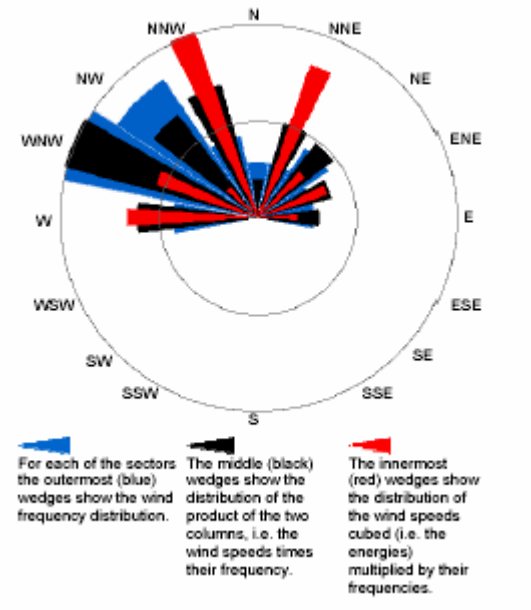
The number of large carrier jets departing to the east during the month of September 2004 increased 28.3% compared to August 2004. Carrier arrival operations from the east towards the west decreased 8.5% compared to operations in August 2004.



Regional Jets & Large Turboprop Aircraft

Regional jets and large turboprop departures towards the east decreased by 16.6% in September 2004 compared to August 2004. The number of regional jets and large turboprop aircraft arriving from the east decreased by 5.4% compared to the previous month.



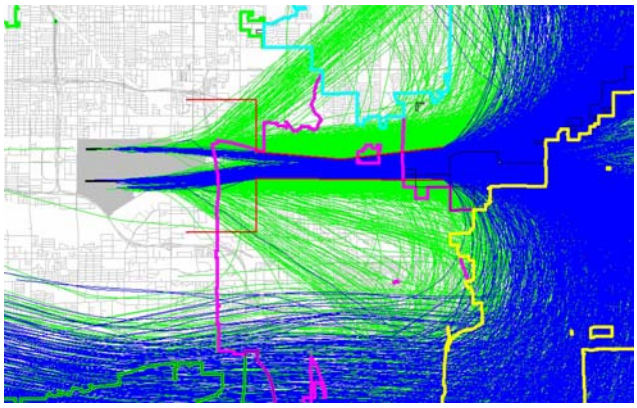


Moderate winds mainly from the northwest with gusts up to moderate breeze, 14.8 knots, during one afternoon.

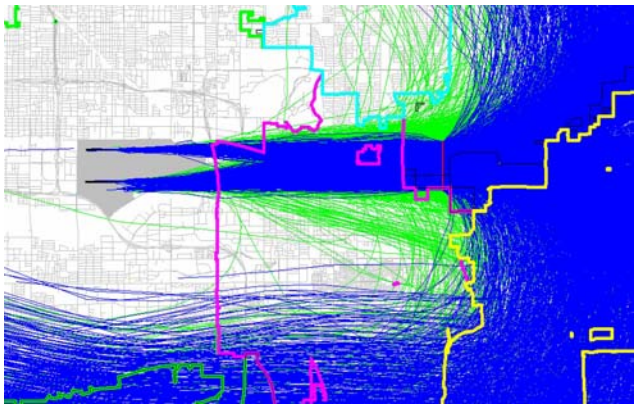
3. Departure Compliance

Compliance Rates

Including the large turboprop aircraft, which routinely are routed on approximate departure angles of 120° towards the southeast and 60° towards the northeast, **63.7%** of all jet and larger turboprop aircraft departures to the east complied with the Tempe Corridor during the month of September 2004. 96.7% of the jets complied with the Phoenix 4 DME gate. Departures by large turboprop aircraft are not included in the Phoenix gate compliance rate.



Flight tracks inside the Tempe Corridor are depicted in blue.



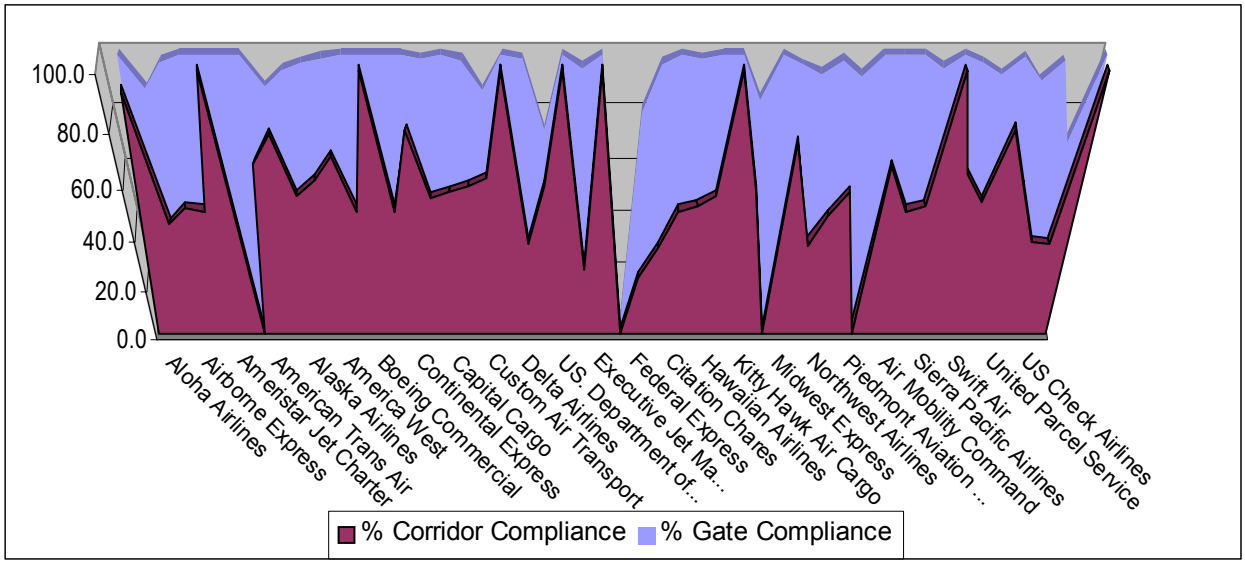
Flight tracks inside the Phoenix Gate are depicted in blue.

Carrier	ICAO Code	%	Carrier	ICAO Code	%	Carrier	ICAO Code	%
Aloha Airlines	AAH	100.0	Continental	COA	75.6	Flexjet	LXJ	100.0
American Airlines	AAL	59.5	Custom Air Transport	CTT	25.0	Midwest Express	MEP	51.9
Airborne Express	ABX	65.7	Delta Airlines	DAL	33.6	GA	N	36.2
Air Canada	ACA	100.0	D&D Aviation	DDA	100.0	Northwest Airlines	NWA	45.1
Ameristar Jet Charter	AJI	0.0	DHL Airways	DHL	45.0	Flight Options	OPT	36.0
Ameriflight	AMF	0.0	US Department of Justice	DOJ	0.0	Polar Air Cargo	PAC	100.0
American Trans Air	AMT	67.1	American Eagle	EGF	100.0	Piedmont Aviation Services	PCE	66.7
Aero Mexico	AMX	33.3	Executive Jet Aviation	EJA	50.0	Sun Country	SCX	66.7
Alaska Airlines	ASA	64.3	Executive Management	EJM	0.0	Sky West	SKW	56.5
Mesa Airlines	ASH	62.6	Falcon Air Express	FAO	0.0	Southwest Airlines	SWA	67.4
America West	AWE	71.6	Federal Express	FDX	39.1	Swift Air	SWQ	28.6
British Airways	BAW	50.0	Frontier Airlines	FFT	31.3	United Airlines	UAL	78.5
Continental Express	BTA	82.6	Citation Chares	FIV	0.0	Universal Jet Aviation	UEJ	0.0
Atlantic Southeast	CAA	40.8	Farelas	FRL	49.4	United Parcel Service	UPS	53.8
Capital Cargo	CCI	50.0	Hawaiian Airlines	HAL	33.3	US Airways	USA	34.9
Cherry Air	CCY	0.0	Kitty Hawk Air Cargo	KHA	31.8	US Check Airlines	USC	35.3

Departures excluded[3]:

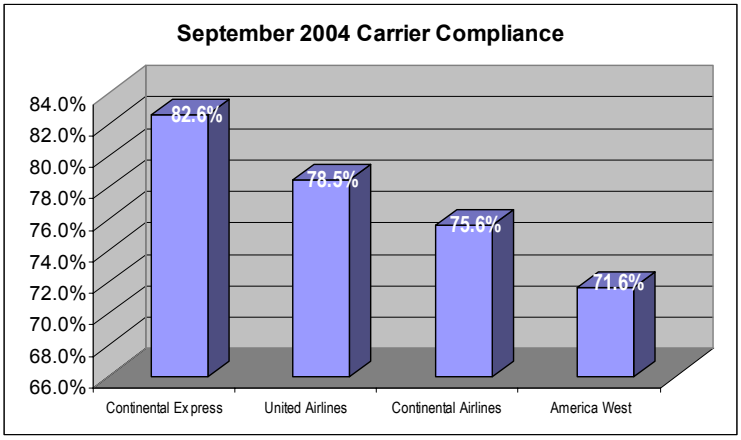
9/6/2004 10:14a.m.-10:56a.m.	9/15/2004 10:49a.m.-11:39a.m.	9/20/2004 6:08a.m.-7:04a.m.
9/7/2004 8:07p.m.-10:28p.m.	9/18/2004 4:12p.m.-11:00p.m.	9/26/2004 9:33a.m.-9:54a.m.
9/11/2004 7:13a.m.-7:31a.m.	89/19/2004 6:15a.m.-2:14 p.m.	9/29/2004 6:11a.m.-10:43a.m.
9/12/2004 9:06a.m.-9:51a.m.	9/19/2004 7:12p.m.-11:00p.m.	

[3] Based on City of Phoenix evaluations of weather influencing navigation east to 4DME.

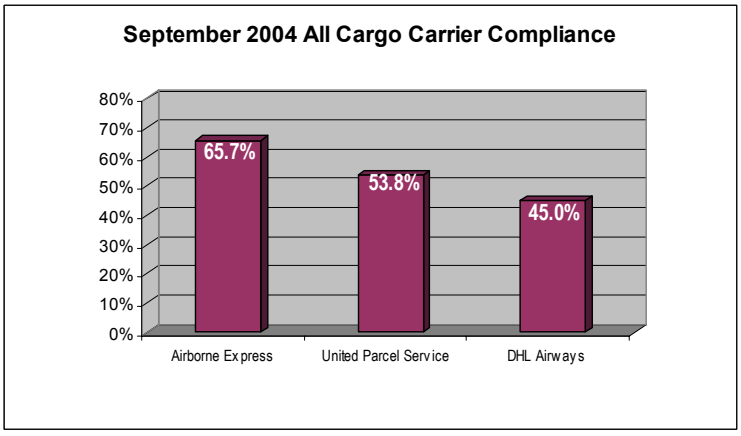


Top Airlines

Among the carriers with over 10 departures to the east during the month of September 2004, 4 had 70% or more of their aircraft stay within the Tempe Corridor. This is not as good as August 2004 when 6 airlines had 70% or more of their aircraft comply with the Tempe Corridor.

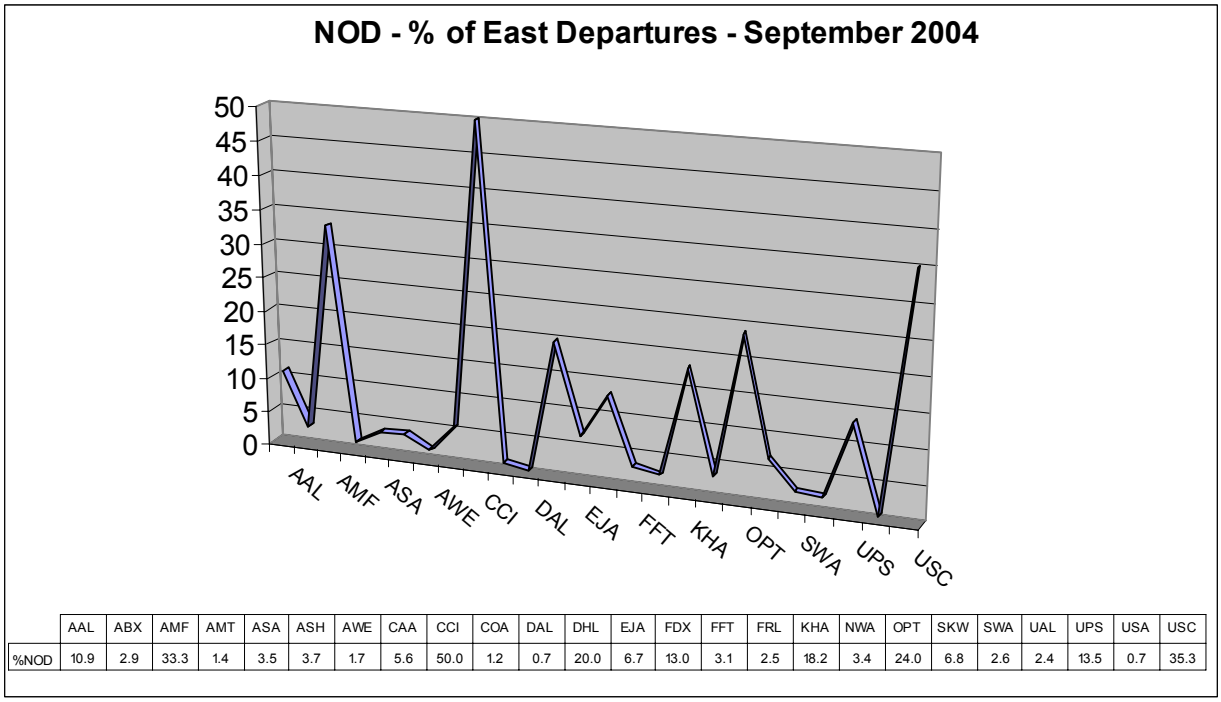


The compliance rates for the top cargo carriers with more than 10 departures to the east during the month of September 2004 was not as good as for August 2004 when the top 3 reached just below 60% of their aircraft in compliance with the Tempe Corridor. However the top score was better in September 2004.



Notice of Deviation

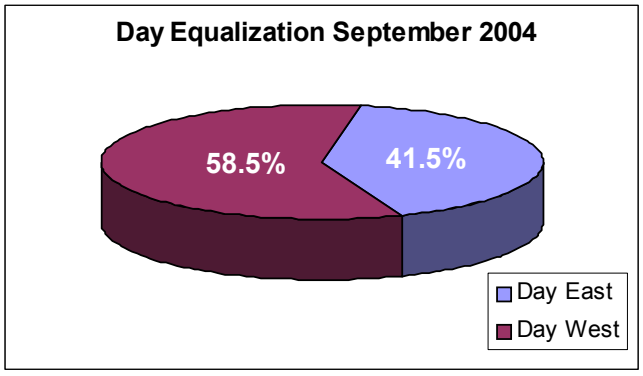
The City of Phoenix issues Notice of Deviation (NOD) to airlines, which jets fail to comply with the 4DME Gate. Among the airlines with at least 5 departures to the east during the month of September 2004, Flight Options and DHL received the most notices relative to the number of east departures registered for each airline.

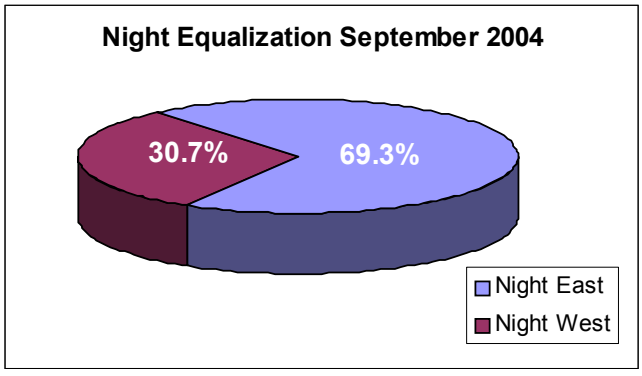


	AAL	ABX	AMF	AMT	ASA	ASH	AWE	CAA	CCI	COA	DAL	DHL	EJA	FDX	FFT	FRL	KHA	NWA	OPT	SKW	SWA	UAL	UPS	USA	USC
%NOD	10.9	2.9	33.3	1.4	3.5	3.7	1.7	5.6	50.0	1.2	0.7	20.0	6.7	13.0	3.1	2.5	18.2	3.4	24.0	6.8	2.6	2.4	13.5	0.7	35.3

4. East/West Departure Split

The split in carrier jet and large commuter aircraft departures to the east and west of the Phoenix Sky Harbor International Airport is generally not as favorable for Tempe during the nighttime hours compared to daytime hours. In September 2004 69.3% went east during nighttime and 41.5% went east during daytime.

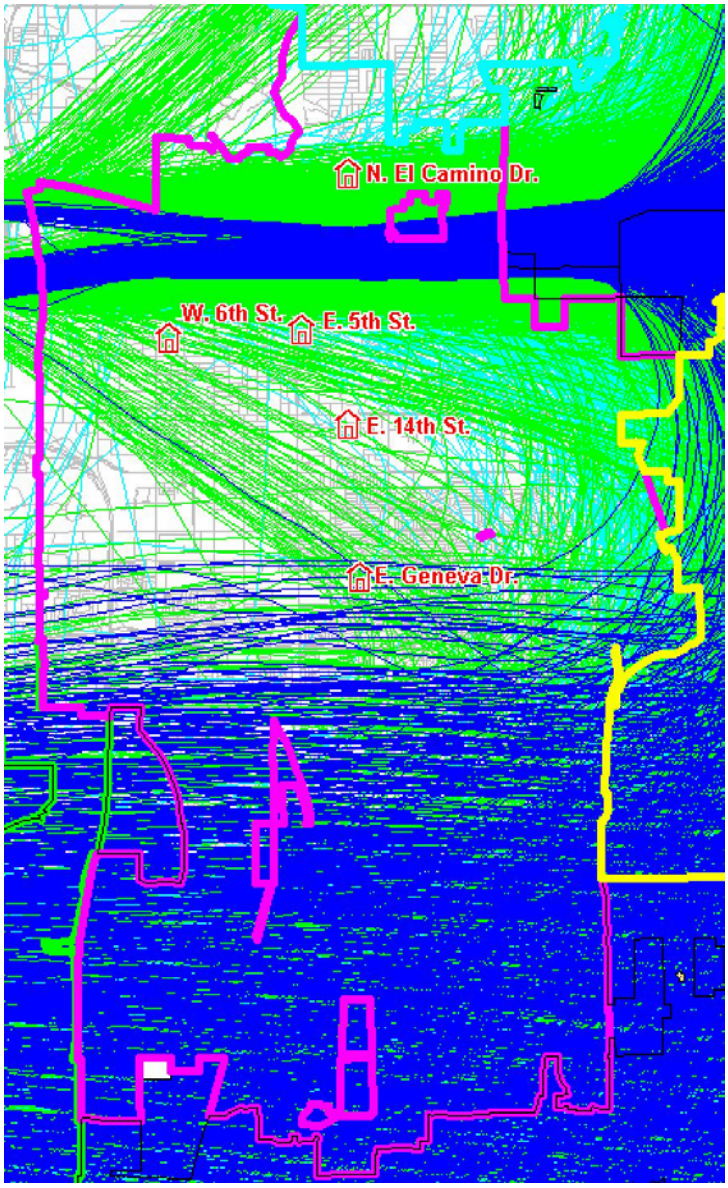




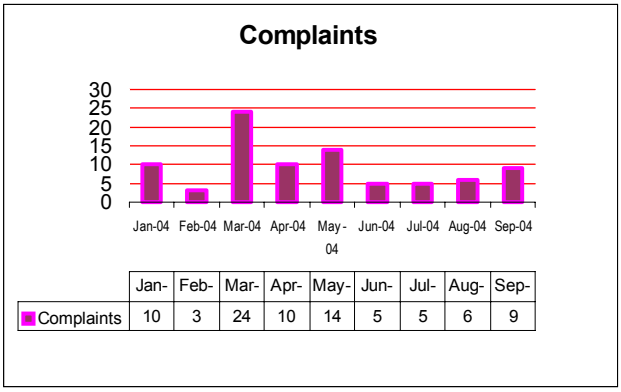
Day and nighttime departures are generated by a query covering day + evening hours and nighttime hours. Day = 7: 00 a.m. to 9:59:59 p.m. local time and Night = 9:59:59 p.m. to 7:00 a.m.

5. Complaints

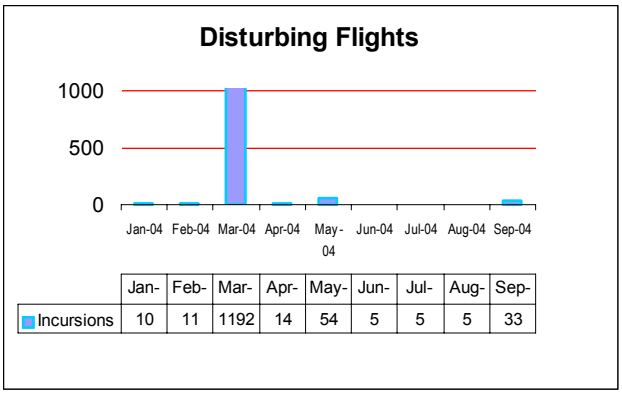
The City of Tempe started registering aircraft noise complaints from Tempe residents in October 2000 after the opening of the third runway at Phoenix Sky Harbor International Airport. During September 2004, 5 residents filed 9 aircraft noise complaints with the City of Tempe. 33 flights were identified as disturbing by being very noisy or off course. This includes 1 complaint over east flow departures initiating too early 180º turns over Tempe towards the west over neighborhoods south of University Drive, 2 complaints over low arrivals from the east over the City Hall, and 2 complaints from one resident listing 9106 noise events as being disturbing from September 5, 2004 through September 26, 2004.



Green flight tracks = Departures outside the Tempe Corridor
Blue flight tracks = Departures inside the Tempe Corridor
Turquoise flight tracks = Arrivals
Addresses of residents that filed complaints =



	Jan-	Feb-	Mar-	Apr-	May-	Jun-	Jul-	Aug-	Sep-
Complaints	10	3	24	10	14	5	5	6	9

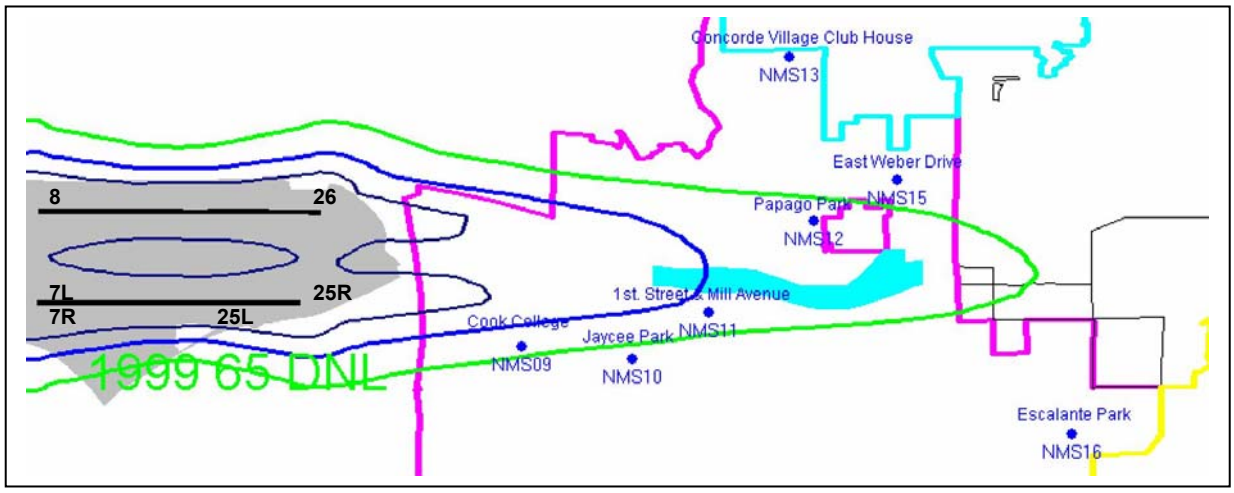


	Jan-	Feb-	Mar-	Apr-	May-	Jun-	Jul-	Aug-	Sep-
Incursions	10	11	1192	14	54	5	5	5	33

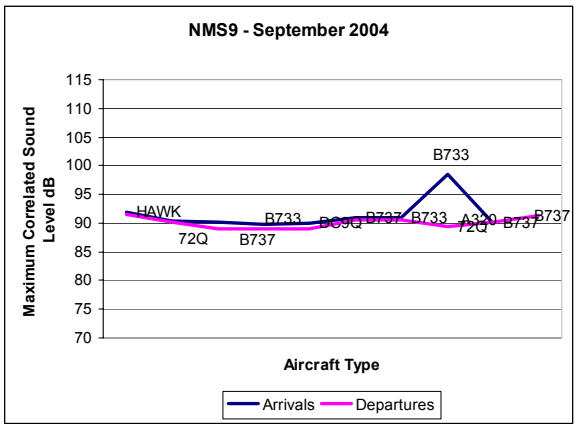
The graph does not include the 9106 noise events reported in September 2004 by one resident.

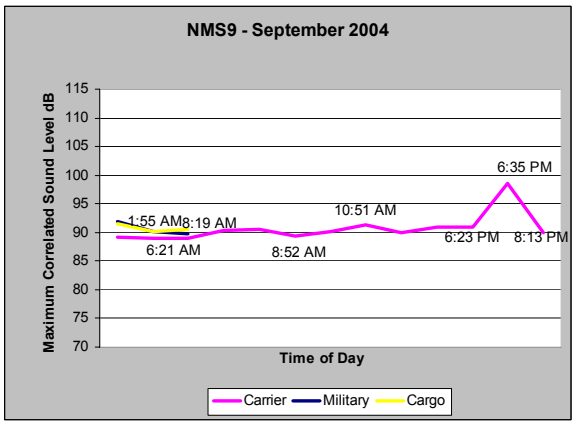
6. Noise

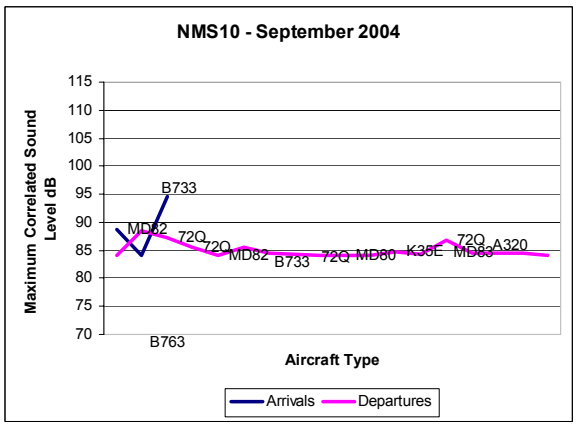
The Phoenix Sky Harbor International Airport Noise and Flight Track Monitoring System include 9 fixed Noise Monitoring Stations (NMS) in Tempe located in north Tempe.

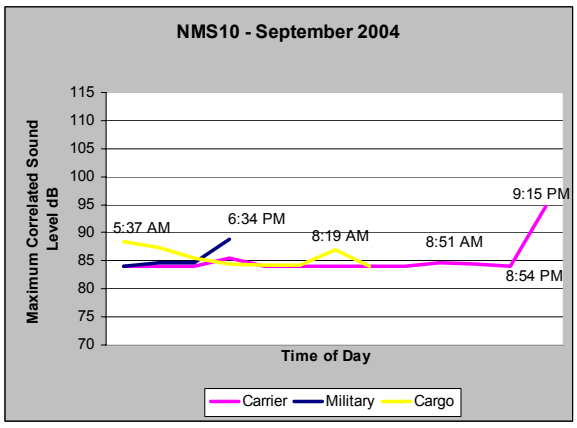


8 monitors are currently in operation, and below data on the highest (Lmax) noise levels registered during this month have been correlated with flight track information from departure and arrival traffic over the area these monitors are located. A time graph show time of day when large aircraft activity reached the highest (Lmax) noise levels.

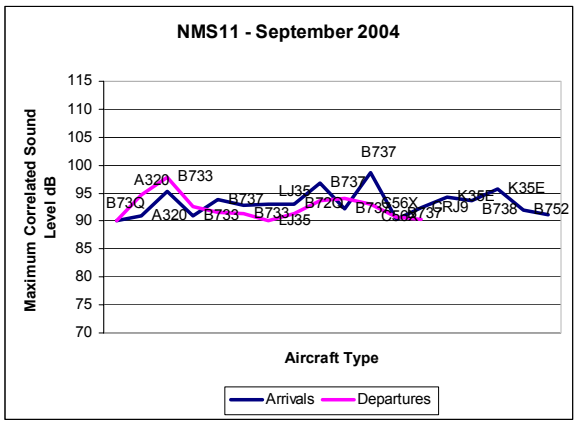


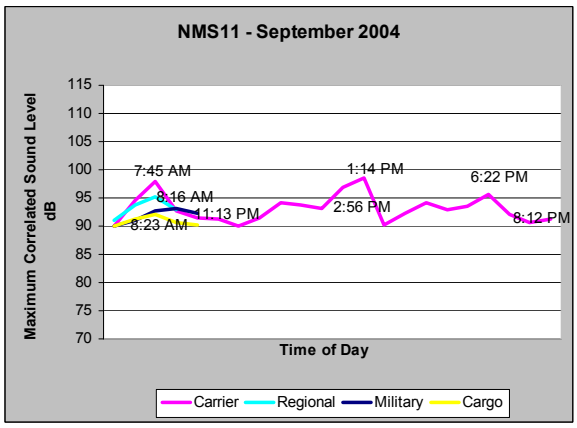




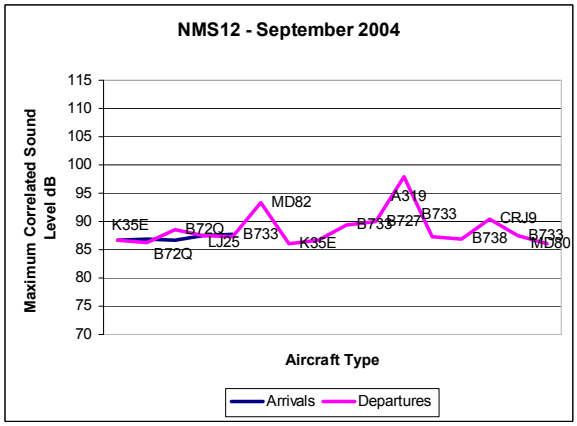


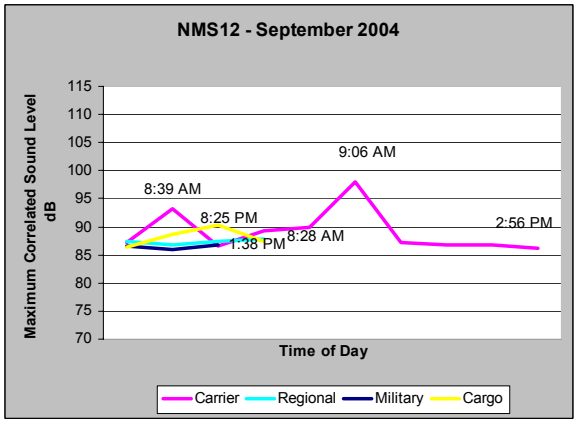
NMS 9 and 10 are south of the extended centerline for the south runway and pick up a lot of the side line noise created by center runway departures and arrivals to the south runway. This includes particularly military activity and medium to smaller cargo operations because this activity is mainly concentrated to facilities located on the south side of the airport.

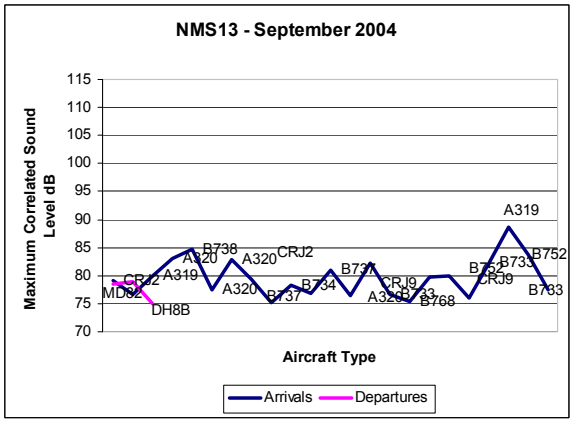


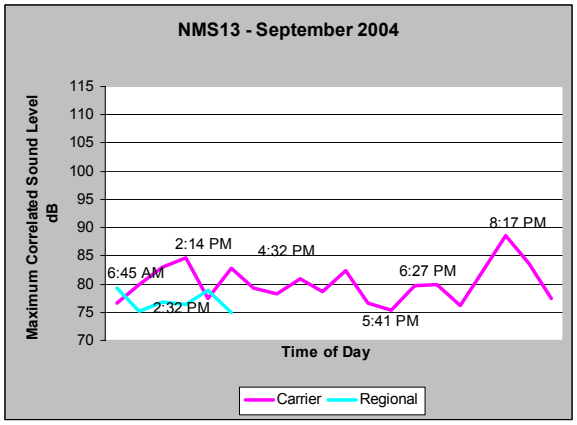


NMS 11 is in the downtown area close to the Town Lake and register noise from all 3 runways, characterized by a relatively even and high maximum levels from both arrival and departure operations.

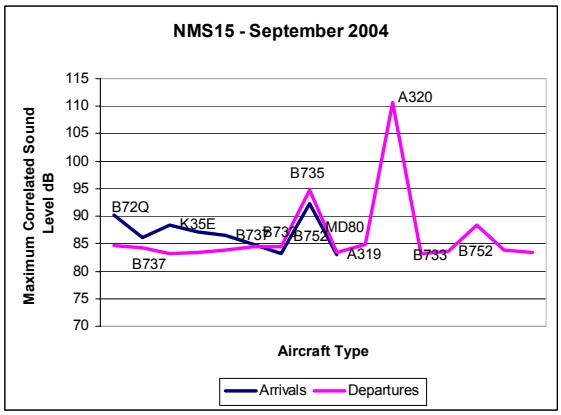


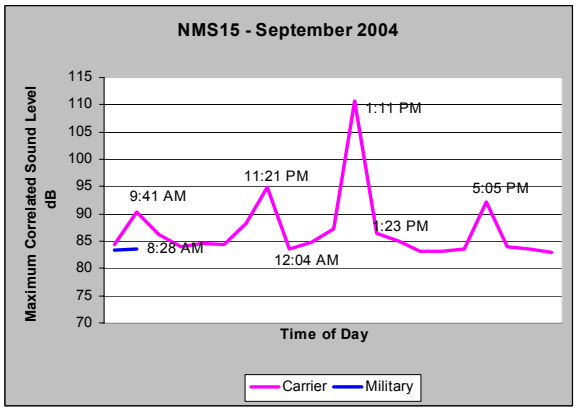






NMS 12, 13 and 15 located to the north of the Town Lake register to a large extent noise from the activities to and from the north runway, and from the center runway for aircraft departing diagonally towards the northeast. Including only the highest correlated noise readings for this month it appears that the highest peak dB (Lmax) level this months where reached over the area of Weber and Curry roads. The flight profile for aircraft arriving to the north runway is somewhat lower compared to aircraft arriving to the south runway. This is because of the runway threshold for the north runway, Runway 26, is located farther to the east than the threshold for the south runway, Runway 25L.





NMS 16 is located farther out to the east than the other noise monitors and pick up aircraft on final approach from the south east and departing aircraft that turn towards the south and southeast at 4DME.